

DRAFT COPY--PRELIMINARY

September 5, 2018

Mr. Leonard Decker
1726 Chateau Bend Ct suite 200
Katy, TX 77450

Re: Mason Bright, DOB 2/14/18

Dear Mr. Decker,

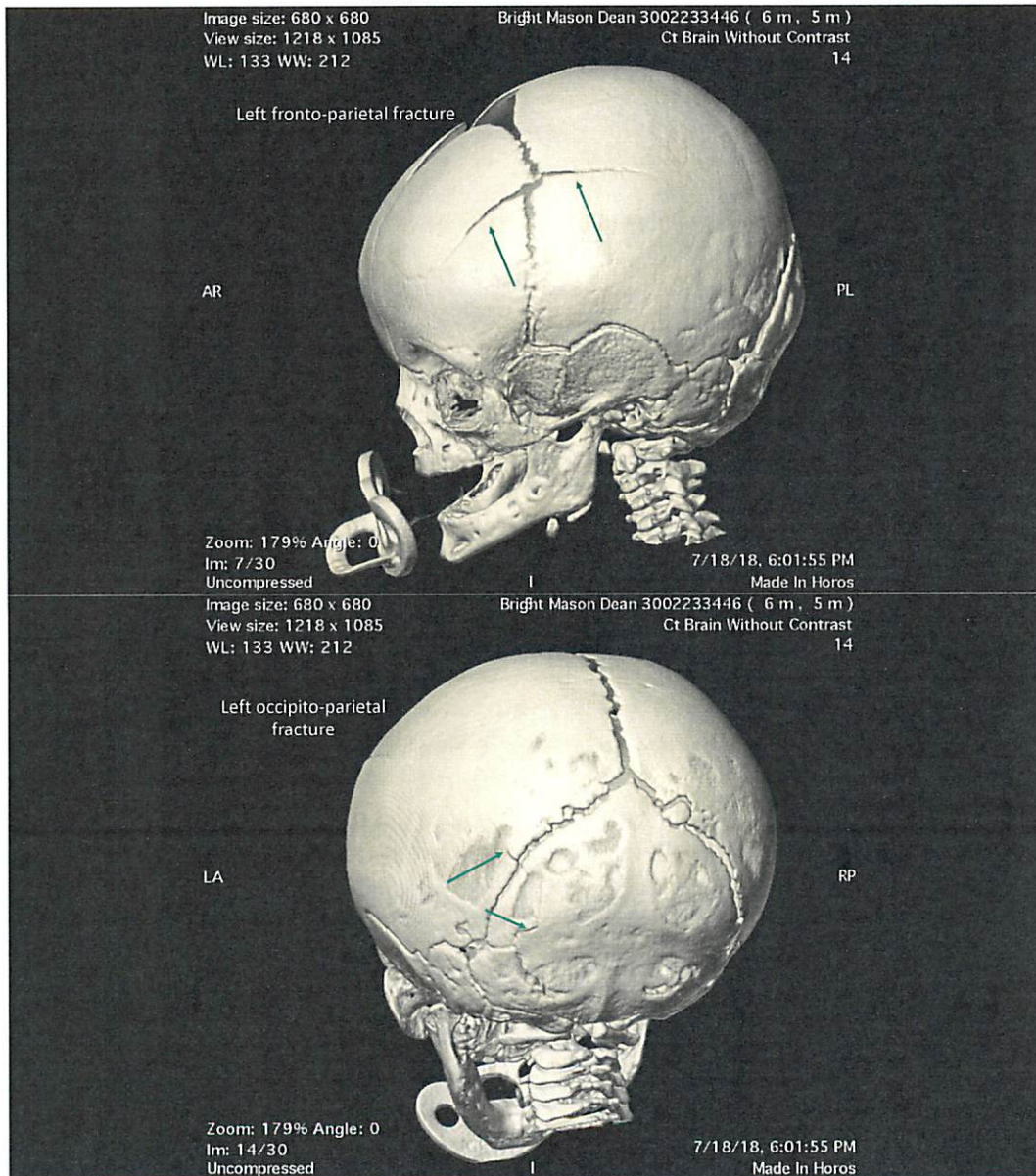
I have received and reviewed several imaging studies on Mason Bright. You have asked me to summarize the findings in the form of a letter. I am a board-certified radiologist with a certificate of added qualifications in pediatric radiology. The focus of my academic research and clinical practice is on the correlation of radiology images with other relevant information, including pathology. I currently spend approximately half of my time in clinical practice consulting with patients who present with symptoms and/or radiologic findings of breast disease. This involves a significant amount of patient interaction and consultation with other specialties, and my practice relies on radiologic-pathologic correlation. The remainder of my time is spent in teaching, research and consultation on cases of abuse and neglect. My research interests include infant cranial anatomy and physiology. I have published and been invited to present at scientific conferences on the anatomy and physiology of the infant dura and meninges. On occasion, as in this case, I am asked to write a letter addressing issues that directly intersect with my interest and research in this area. My C.V. is attached. The opinions I express below are based on my training and experience in the interpretation of medical imaging studies and held to a reasonable degree of medical certainty.

I have received the CT exam of the head on Mason at approximately 615 pm on 7/18/18 and the CT cervical spine taken the same evening at approximately 7 pm. I understand that a full MRI exam was performed the following day, but I did not receive the full study. Therefore, my comments below are limited to the CT exam.

Based on my review of the 60-page PDF of medical records from Texas Children's Hospital that I received, I understand that Mason fell from a chair onto concrete on 7/18/18. He immediately cried and had a possible brief period of unresponsiveness. Emergency medical services were contacted immediately. Head CT study disclosed two skull fractures, soft tissue swelling, and mixed density subdural collections. Dr. Shanghvi from Child Protective Health saw Mason and the medical note written by Dr. Shanghvi raised the possibility of abuse due to the presence of two skull fractures and subdural hemorrhage.

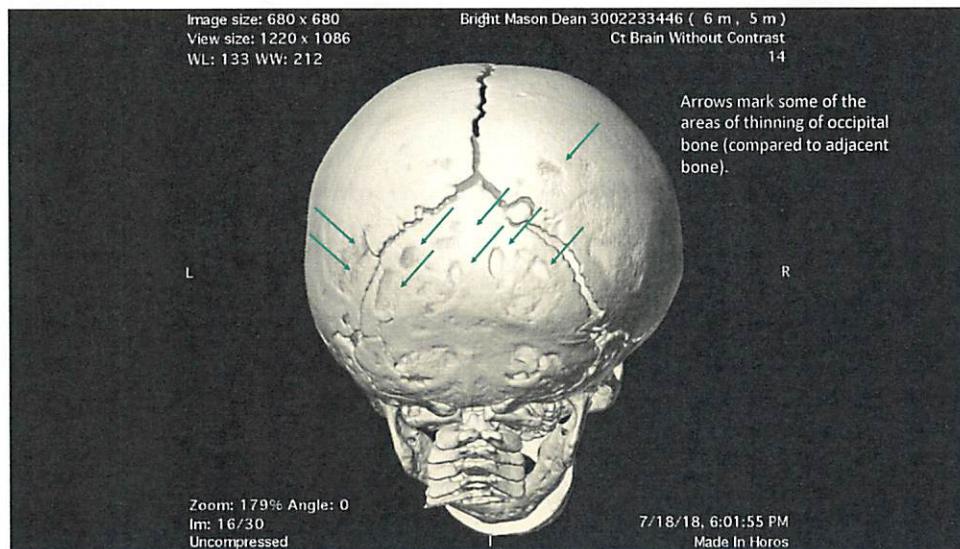
I further understand that Mason was seen by hematology and has been diagnosed with Von Willebrand disease. You have specifically asked me to comment on the skull fractures.

CT skull findings: The radiology imaging shows two skull fractures. Below are two annotated images from the 3D reconstructions provided on the DICOM imaging data set that was provided to me.



Both of these skull fractures were associated with soft tissue swelling and therefore "acute" (recent) in age.

The 3D reconstructions also show multiple areas of thinning of the occipital and posterior parietal bones. This thinning is captured on the reconstructions, demonstrated as areas that are “shaded” on the 3D images (see arrows below). The thinning of these areas of the bone is also seen on the 2D image series.



The occipital (posterior) skull fracture traverses an area of thinned bone.

Comments: The thinned bone are areas of bone represent areas of delayed and/or deficient ossification. There are multiple potential causes of thinned calvarial bone, varying from mineralization defects to normal developmental variation. However, whatever the cause, they represent areas of relatively weaker bone. Weakened areas of bone are more susceptible to fracture from lower force (see for instance the series of experimental papers by Weber, previously provided, who concludes that these areas form “fracture prone weak spots”).

The infant skull is more susceptible to fracture than the skull of an older child. Ibrahim (2012, Int. J Dev Neuroscience 30(3): 201-206) reports that skull fractures are more frequent in less than 3 ft falls in infants compared to toddlers, and this finding can be explained by the relatively thinner skull in the infant compared to the toddler.

A single impact can result in more than one fracture. Weber’s experimental paper (1984) showed that multiple skull fractures can occur from simple falls. Ibrahim also reported multiple fractures in infants from falls less than 3 feet.

Mason’s skull fractures are simple (linear), are on the same side of the head (left), and the smaller fracture traverses an area of thinned bone. The skull fractures are accompanied by soft tissue swelling, confirming they are recent. There is nothing about their location or appearance that precludes the possibility they both arose from a single fall. Therefore, it is not safe to

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conclude that these skull fractures could not have occurred from the mechanism described by Mason's mother.

I am happy to discuss further the anatomy and embryology of the dura and the variations in the draining veins of the brain if this would further help you understand why dural and subdural hemorrhage may occur with short falls. In addition to dural bleeding, dural based effusions (fluid, low density on CT) can also occur with minor trauma. A combination of blood and fluid would result in a "mixed density" appearance on CT exam. Therefore, the presence of both low- and high-density fluid on CT surrounding the brain can be explained by a short fall. The presence of a documented bleeding disorder in Mason would increase the risk of bleeding with minor trauma.

In summary, there is nothing about the CT findings in this case that contradict the mother's statement that Mason suffered a fall onto concrete that resulted in bleeding around the brain and skull fractures.

Please do not hesitate to contact me if you have further questions regarding the imaging findings.

Sincerely,

Julie A. Mack MD